



**DIVISION: 05 00 00—METALS**

**Section: 05 40 00—Cold-Formed Metal Framing**

**DIVISION: 09 00 00—FINISHES**

**Section: 09 22 16.13—Non-Structural Metal Stud Framing**

**REPORT HOLDER:**

**WARE INDUSTRIES, INC. (DBA MarinoWARE)**

**EVALUATION SUBJECT:**

**VIPERSTUD DRYWALL FRAMING SYSTEM (NON-STRUCTURAL): VIPER25, VIPER20, VIPER20D, VIPER 18MIL, VIPER 27MIL, VIPER 30MIL, AND VIPER 33MIL**

**ADDITIONAL LISTEES:**

**CALIFORNIA EXPANDED METAL COMPANY (CEMCO)**

**IMPERIAL BUILDING PRODUCTS**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- 2021, 2018, 2015, and 2012 *International Building Code*® (IBC)
- 2021 and 2018 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see [ESR-2620 CBC and CRC supplement](#).

**Property evaluated:**

Structural

**2.0 USES**

ViperStud studs and tracks are used for framing of interior nonload-bearing walls and ceiling framing.

**3.0 DESCRIPTION**

**3.1 General:**

Products recognized under this report are limited to the ViperStud studs and tracks noted in Table 2. The studs are roll-formed in a “C” shape with a rib (ViperRib) in the flange, an offset (planking) in the web and knurling on the flanges.

The tracks are channel-shaped with offsets (planking) in the web. The studs are manufactured with and without punch-outs. The overall dimensions for the punch-outs are:

MANUFACTURER	MEMBER DEPTH	
	1 <sup>5</sup> / <sub>8</sub> " & 2 <sup>1</sup> / <sub>2</sub> "	3 <sup>5</sup> / <sub>8</sub> ", 4" & 6"
MarinoWARE	0.75" x 1.75"	1.50" x 2.50"
CEMCO	0.75" x 2.00"	1.50" x 2.75"
Imperial Building Products	0.75"x3.53"	1.50"x4.22"

For SI: 1 inch = 25.4 mm.

Punch-outs are spaced 24 inches (610 mm) on center along the centerline of the member, with a minimum distance of 10 inches (254 mm) from the end of the member to the near edge of the punch-out, when provided. See Figure 1 for stud and track configurations. See Figure 2 for punch-out configurations. See Table 1 for manufacturing locations.

**3.2 Material:**

**3.2.1 Steel:** The Viper25 studs and tracks and Viper20D and Viper 20 tracks are formed from coils of steel complying with ASTM A1003 Nonstructural Grade 50 (NS50) steel. The Viper20D studs are formed from coils of steel complying with ASTM A1003 Nonstructural Grade 57 (NS57) steel. The Viper20 studs are formed from coils of steel complying with ASTM A1003 NS Grade70 (NS70). The Viper 18mil, Viper 27mil, Viper 30mil and Viper 33mil studs and tracks are formed from coils of steel complying with ASTM A1003 Nonstructural Grade 33 (NS33) steel. The uncoated minimum base-metal thickness is specified in Table 2. The coating is minimum G40., AZ50, or GF30. Other protective coating with an equivalent corrosion resistance may be used and is subject to approval by the building official

**3.2.2 Gypsum Wallboard:** For composite wall assemblies, gypsum wallboard must be a minimum of 5/8 inch (15.9 mm) thick and Type X, complying with ASTM C1396 and manufactured by one of the following companies: American Gypsum; CertainTeed; Georgia Pacific; Lafarge; National Gypsum; or USG. For non-composited wall assemblies, the gypsum wallboard is allowed to be any gypsum wallboard allowed by the applicable code.

**3.2.3 Fasteners:** Fasteners for attaching the gypsum wallboard to the studs and tracks must be No. 6, Type S, fine thread drywall bugle head screws conforming to ASTM C1002.

**4.0 DESIGN AND INSTALLATION**

**4.1 Design:**

Allowable wall heights for interior nonload-bearing composite wall design are shown in Table 3.

Allowable wall heights for interior nonload-bearing non-composite wall design are shown in Tables 5 and 6.

Allowable spans for ceiling framing are shown in Table 7.

Spans noted in Tables 5, 6, and 7 are based on the section properties noted in Table 4.

**4.2 Installation:**

Installation of ViperStud studs and tracks must be in accordance with the approved plans and this report. The approved plans must be available on the jobsite at all times during installation.

**4.2.1** For composite system walls, fastening of studs to tracks is optional. End bearing of the stud on the track must be a minimum of 1 inch (25 mm). Gypsum wallboard must be installed on both sides of the wall framing for the full wall height, with the long dimension of the gypsum wallboard parallel to the studs. Placement of joints in the gypsum sheathing must be in accordance with Sections 4.6.3 and 4.6.4 of GA-216 (Gypsum Association Application and Finishing of Gypsum Panel Products) or Section 7.5 of ASTM C840.

Maximum spacing of fasteners fastening the gypsum wallboard to the studs and tracks must be as follows:

STUD SPACING	STUDS	TRACKS
12" o.c.	12" o.c.	16" o.c.
16" o.c.	12" o.c.	16" o.c.
24" o.c.	12" o.c.	12" o.c.

For SI: 1 inch = 25.4 mm.

**4.2.2** Sheathing used with ceiling framing and non-composite system walls must be installed in accordance with the applicable code requirements for the sheathing material.

**5.0 CONDITIONS OF USE**

The ViperStud studs and tracks described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Installation must comply with the approved plans and this report. In the event of a conflict, this report governs.
- 5.2** The interior nonload-bearing wall assemblies are limited to interior installations where the superimposed axial load is zero pounds.
- 5.3** Design of the attachment of the wall to the surrounding structure is outside the scope of this report.

- 5.4** Installation of the gypsum wallboard must meet the requirements of ASTM C840 or GA-216.
- 5.5** Use of ViperStud studs and tracks in other than non-structural applications, as defined by AISI S220, is outside the scope of this report.
- 5.6** Complete construction documents and calculations verifying compliance with this report must be submitted to the code official for each project. The calculations and construction documents must be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

**6.0 EVIDENCE SUBMITTED**

- 6.1** Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members (AC46), dated October 2019 and editorially revised December 2020.
- 6.2** Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members—Interior Nonload-bearing Wall Assemblies (AC86), dated June 2019 and editorially revised December 2020.

**7.0 IDENTIFICATION**

**7.1** Each ViperStud stud and track covered by this report must have a legible label or stamp, at a maximum spacing of 96 inches (2438 mm) on center, indicating the manufacturer's name or initials [MarinoWARE (MW), California Expanded Metal Company (CEMCO), or Imperial Building Products]; the minimum bare metal thickness in mils or inches; the minimum yield strength in ksi (if other than 33 ksi); the coating designation (if other than G40); the designation "NS"; and the evaluation report number (ESR-2620).

**7.2** The report holder's contact information is the following:

**WARE INDUSTRIES, INC. (dba MarinoWARE)**  
**400 METUCHEN ROAD**  
**SOUTH PLAINFIELD, NEW JERSEY 07080**  
**(908) 757-9000**  
[www.marinoware.com](http://www.marinoware.com)

**7.3** The additional listees' information is the following:

**CALIFORNIA EXPANDED METAL COMPANY (CEMCO)**  
**263 NORTH COVINA LANE**  
**CITY OF INDUSTRY, CALIFORNIA 91746**  
**(800) 775-2362**  
[www.cemcosteel.com](http://www.cemcosteel.com)

**IMPERIAL BUILDING PRODUCTS**  
**4500, BERNARD-LEFEBVRE STREET**  
**LAVAL, QUEBEC H7C 0A5**  
**(450) 728-4500**

TABLE 1—MANUFACTURING LOCATIONS

**MARINOWARE**  
 South Plainfield, NJ 07080  
 Griffin, GA 30223  
 East Chicago, IN 46312

**CEMCO**  
 City of Industry, CA 91746  
 Pittsburg, CA 94565  
 Denver, CO 80204  
 Fort Worth, TX 76140

**IMPERIAL BUILDING PRODUCTS**  
 Quebec, Canada H7C 0A5  
 Ontario, Canada L6T 5V8

TABLE 2—MEMBER THICKNESS

MEMBER (name)	STUD ID <sup>1</sup>	TRACK ID <sup>1</sup>	MINIMUM BASE-METAL THICKNESS (in)	DESIGN THICKNESS (in)	MINIMUM YIELD STRENGTH (ksi)
Viper25	xxxVS125-15	xxxVT125-15	0.0147	0.0155	50
Viper20	xxxVS125-18	xxxVT125-18	0.0181	0.0190	70 (stud) 50 (track)
Viper20D (1.625 – 3.625) <sup>2</sup>	xxxVS125-20	xxxVT125-20	0.0195	0.0205	57 (stud) 50 (track)
Viper20D (4.00 – 6.00) <sup>2</sup>	xxxVS125-21	xxxVT125-21	0.0209	0.0220	57 (stud) 50 (track)
Viper 18mil	xxxVS125-18	xxxVT125-18	0.0179	0.0188	33
Viper 27mil	xxxVS125-27	xxxVT125-27	0.0269	0.0283	33
Viper 30mil	xxxVS125-30	xxxVT125-30	0.0296	0.0312	33
Viper 33mil	xxxVS125-33	xxxVT125-33	0.0329	0.0346	33

For SI: 1 inch = 25.4 mm, 1 ksi = 6.895 MPa.

<sup>1</sup>xxx is the web size in 1/100 of an inch.

<sup>2</sup>Applicable range of depths, in inches, for the member.

TABLE 3—COMPOSITE WALL LIMITING HEIGHTS<sup>1,2,3,4</sup> (ft-in)

DEPTH (in)	MEMBER (name) (STUD SECTION ID)	SPACING (in)	5 psf			7.5 psf			10 psf		
			L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>	L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>	L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>
1 <sup>5</sup> / <sub>8</sub>	Viper25 (162VS125-15)	12	13-9	11-4	9-10	12-0	9-11	8-3	10-11	8-10	----
		16	12-6	10-4	8-8	10-11	8-10	----	9-11	7-11	----
		24	10-11	8-10	----	9-5	----	----	8-2	----	----
	Viper20 (162VS125-18)	12	13-10	11-0	9-7	12-1	9-7	8-5	11-0	8-9	----
		16	12-7	10-0	8-9	11-0	8-9	7-11	10-0	7-11	----
		24	11-0	8-9	----	9-7	----	----	8-9	----	----
	Viper20D (162VS125-20)	12	14-3	11-3	9-10	12-5	9-10	8-5	11-3	8-10	----
		16	12-11	10-3	8-10	11-3	8-10	----	10-3	7-11	----
		24	11-3	8-10	----	9-10	----	----	8-10	----	----
	Viper 18mil (162VS125-18)	12	12-10	10-7	9-4	11-3	9-3	8-2	10-3	8-5	----
		16	11-9	9-8	8-6	10-3	8-5	----	9-4	----	----
		24	10-3	8-5	----	8-0	----	----	8-2	----	----
	Viper 27mil (162VS125-27)	12	14-4	11-5	9-11	12-6	9-11	8-5	11-5	8-10	---
		16	13-0	10-4	8-10	11-5	8-10	---	10-4	7-10	----
		24	11-5	8-10	---	9-10	---	----	8-6	----	----
	Viper 30mil (162VS125-30)	12	14-7	11-6	10-0	12-9	10-0	8-6	11-7	8-11	---
		16	13-3	10-5	8-11	11-7	8-11	---	10-6	7-10	---
		24	11-7	8-11	---	10-1	---	---	8-10	---	---
	Viper 33mil (162VS125-33)	12	14-11	11-10	10-4	13-0	10-4	8-10	11-10	9-4	7-11
		16	13-6	10-9	9-4	11-10	9-4	7-11	10-9	8-4	---
		24	11-10	9-4	7-11	10-4	7-11	---	9-4	---	---
2 <sup>1</sup> / <sub>2</sub>	Viper25 (250VS125-15)	12	17-3	14-5	12-9	15-0	12-7	11-1	13-8	11-6	10-1
		16	15-8	13-1	11-7	13-8	11-6	10-1	12-3	10-5	8-9
		24	13-8	11-6	10-1	11-6	10-0	8-2	10-0	8-8	---
	Viper20 (250VS125-18)	12	18-2	14-5	12-7	15-10	12-7	11-0	14-5	11-5	9-10
		16	16-6	13-1	11-5	14-5	11-5	9-10	13-1	10-4	8-10
		24	14-5	11-5	9-10	12-7	9-10	8-5	11-5	8-10	----
	Viper20D (250VS125-20)	12	17-11	14-10	13-2	5-8	13-0	11-6	14-3	11-10	10-5
		16	16-4	13-6	12-0	14-3	11-10	10-5	12-11	10-9	9-4
		24	14-3	11-10	10-5	12-5	10-4	8-9	11-3	9-2	---
	Viper 18mil (250VS125-18)	12	17-5	14-5	12-7	14-7	12-7	11-0	12-8	11-5	9-8
		16	15-6	13-1	11-6	12-8	11-6	9-8	8-11	8-6	----
		24	12-7	11-5	9-8	10-4	9-8	8-0	8-11	8-6	----
	Viper 27mil (250VS125-27)	12	8-3	14-5	12-8	15-11	12-8	11-0	14-4	11-6	10-0
		16	16-7	13-2	11-6	14-4	11-6	10-0	12-5	10-5	8-11
		24	14-4	11-6	10-0	11-9	10-0	8-6	10-2	8-11	---
	Viper 30mil (250VS125-30)	12	18-9	14-10	13-0	16-4	13-0	11-4	14-10	11-10	10-4
		16	17-0	13-6	11-10	14-10	11-10	10-4	13-6	10-9	9-3
		24	14-10	11-10	10-4	12-9	10-4	8-10	11-0	9-3	7-10
	Viper 33mil (250VS125-33)	12	19-4	15-4	13-5	16-10	13-5	11-8	15-4	12-2	10-8
		16	17-7	13-11	12-2	15-4	12-2	10-8	13-11	11-0	9-8
		24	15-4	12-2	10-8	13-5	10-8	9-2	12-0	9-8	8-2

TABLE 3—COMPOSITE WALL LIMITING HEIGHTS<sup>1,2,3,4</sup> (ft-in) – Continued

DEPTH (in)	MEMBER (name) (STUD SECTION ID)	SPACING (in)	5 psf			7.5 psf			10 psf		
			L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>	L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>	L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>
3 <sup>5</sup> / <sub>8</sub>	Viper25 (362VS125-15)	12	20-10	17-3	15-2	18-2	15-1	13-3	15-10	13-9	12-0
		16	18-11	15-9	13-9	15-10	13-9	12-0	13-9	12-6	10-11
		24	15-10	13-9	12-0	12-11	12-0	10-6	11-3	10-11	9-6
	Viper20 (362VS125-18)	12	21-11	18-0	15-10	19-1	15-9	13-10	17-5	14-3	12-7
		16	19-11	16-4	14-5	17-5	14-3	12-7	15-10	13-0	11-4
		24	17-5	14-3	12-7	15-2	12-6	10-10	13-10	11-3	9-9
	Viper20D (362VS125-20)	12	21-10	17-11	15-9	19-1	15-8	13-9	17-4	14-3	12-6
		16	19-10	16-4	14-4	17-4	14-3	12-6	15-4	12-11	11-4
		24	17-4	14-3	12-6	14-6	12-5	10-11	12-7	11-4	9-11
	Viper 18mil (362VS125-18)	12	18-7	15-11	13-11	17-8	15-4	13-5	15-3	13-11	12-2
		16	18-9	15-11	13-11	15-3	13-11	12-2	13-3	12-8	10-11
		24	15-3	13-11	12-2	12-6	12-2	10-6	10-10	10-10	9-5
	Viper 27mil (362VS125-27)	12	22-9	18-1	15-10	19-11	15-10	13-10	17-7	14-4	12-6
		16	20-8	16-5	14-4	17-7	14-4	12-6	15-3	13-0	11-2
		24	17-7	14-4	12-5	14-4	12-6	10-8	12-5	11-2	---
	Viper 30mil (362VS125-30)	12	23-3	18-6	16-2	20-4	16-2	14-1	18-6	14-8	12-10
		16	21-2	16-9	14-8	18-6	14-8	12-10	16-4	13-4	11-6
		24	18-6	14-8	12-10	15-4	12-10	11-0	13-4	11-6	9-11
	Viper 33mil (362VS125-33)	12	23-10	18-11	16-6	20-10	16-6	14-5	18-11	15-0	13-1
		16	21-8	17-2	15-0	18-11	15-0	13-1	17-2	13-8	11-10
		24	18-11	15-0	13-1	16-6	13-1	11-4	14-4	11-10	10-3
4	Viper25 (400VS125-15)	12	22-1	18-3	16-3	19-3	15-11	14-2	16-8	14-6	12-11
		16	20-0	16-7	14-9	16-8	14-6	12-11	14-5	13-2	11-9
		24	16-8	14-6	12-11	13-7	12-8	11-3	11-9	11-6	10-1
	Viper20 (400VS125-18)	12	22-11	18-11	16-8	20-0	16-7	14-7	18-2	15-1	13-3
		16	20-10	17-3	15-2	18-2	15-1	13-3	16-6	13-8	12-1
		24	18-2	15-1	13-3	15-10	13-2	11-7	14-5	11-11	10-5
	Viper20D (400VS125-21)	12	24-0	19-1	16-8	21-0	16-8	14-7	19-1	15-2	13-3
		16	21-10	17-4	15-2	19-1	15-2	13-3	17-4	13-9	12-0
		24	19-1	15-2	13-3	16-8	13-3	11-7	14-11	12-0	10-5
	Viper 18mil (400VS125-18)	12	20-6	18-5	16-3	16-9	16-1	14-2	14-6	14-6	12-11
		16	17-9	16-9	14-9	14-6	14-6	12-11	12-7	12-7	11-9
		24	14-6	14-6	12-11	11-10	11-10	11-2	10-3	10-3	9-11
	Viper 27mil (400VS125-27)	12	24-9	19-8	17-2	20-7	17-2	15-0	17-10	15-7	13-8
		16	21-10	17-11	15-7	17-10	15-7	13-8	15-5	14-2	12-4
		24	17-10	15-7	13-8	14-7	13-8	11-10	12-7	12-4	10-9
	Viper 30mil (400VS125-30)	12	25-2	20-0	17-6	22-0	17-6	15-3	19-5	15-11	13-10
		16	22-11	18-2	15-11	19-5	15-11	13-10	16-10	14-5	12-7
		24	19-5	15-11	13-10	15-10	13-10	12-1	13-9	12-7	10-11
	Viper 33mil (400VS125-33)	12	25-8	20-4	17-10	22-5	17-10	15-7	20-4	16-2	14-1
		16	23-4	18-6	16-2	20-4	16-2	14-1	18-4	14-8	12-10
		24	20-4	16-2	14-1	17-3	14-2	12-4	15-0	12-10	11-2

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

TABLE 3—COMPOSITE WALL LIMITING HEIGHTS<sup>1,2,3,4</sup> (ft-in) – Continued

DEPTH (in)	MEMBER (name) (STUD SECTION ID)	SPACING (in)	5 psf			7.5 psf			10 psf		
			L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>	L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>	L <sub>120</sub>	L <sub>240</sub>	L <sub>360</sub>
6	Viper25 (600VS125-15)	12	24-8	23-9	21-1	22-3	20-9	18-5	20-0	18-10	16-9
		16	22-11	21-7	19-2	20-0	18-10	16-9	17-5	17-2	15-3
		24	20-0	18-10	16-9	16-5	16-5	14-8	14-2	14-2	13-0
	Viper20 (600VS125-18)	12	30-6	26-0	23-0	26-7	22-9	20-1	24-2	20-8	18-4
		16	27-8	23-7	20-11	24-2	20-8	18-4	21-12	18-9	16-8
		24	24-2	20-8	18-4	20-11	18-0	16-0	18-1	16-5	14-7
	Viper20D (600VS125-21)	12	29-1	25-7	22-6	25-10	22-4	19-8	23-8	20-4	17-11
		16	26-9	23-3	20-6	23-8	20-4	17-11	21-9	18-6	16-3
		24	23-8	20-4	17-11	20-11	17-9	15-7	18-2	16-2	14-2
	Viper 18mil (600VS125-18)	12	25-5	24-9	21-8	20-9	20-9	18-11	18-0	18-0	17-2
		16	22-0	22-0	19-8	18-0	18-0	17-2	15-7	15-7	15-7
		24	18-0	18-0	17-2	14-8	14-8	14-8	12-9	12-9	12-9
	Viper 27mil (600VS125-27)	12	29-7	25-11	22-8	24-2	22-8	19-9	20-11	20-7	18-0
		16	25-7	23-6	20-7	20-11	20-7	18-0	18-1	18-1	16-4
		24	20-11	20-7	18-0	17-1	17-1	15-8	14-9	14-9	14-2
	Viper 30mil (6002VS125-30)	12	31-10	26-9	23-4	26-0	23-4	20-5	22-6	21-3	18-6
		16	27-7	24-3	21-3	22-6	21-3	18-6	19-6	19-3	16-10
		24	22-6	21-3	18-6	18-5	18-5	16-2	15-11	15-11	14-8
	Viper 33mil (600VS125-33)	12	34-5	27-7	24-1	28-1	24-1	21-1	24-4	21-11	19-2
		16	29-10	25-1	21-11	24-4	21-11	19-2	21-1	19-11	17-5
		24	24-4	21-11	19-2	19-11	19-2	16-9	17-2	17-2	15-2

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

<sup>1</sup>Sheathing, as specified in Section 3.2.2, must be attached to both faces of the wall for the full height of the wall with the long dimension parallel to the studs.

<sup>2</sup>Sheathing must be fastened to the studs with fasteners as specified in Section 3.2.3 at a maximum spacing of 12 inches o.c. Sheathing must be fastened to the tracks with the fasteners as specified in Section 3.2.3 at a maximum spacing of 12 inches on center for walls with studs spaced at 24 inches on center. Sheathing must be fastened to the tracks with the fasteners as specified in Section 3.2.3 at a maximum spacing of 16 inches on center for walls with studs spaced at 12 or 16 inches on center.

<sup>3</sup>Placement of joints in the gypsum sheathing must be in accordance with Sections 4.6.3 and 4.6.4 of GA-216 or Section 7.5 of ASTM C840.

<sup>4</sup>End bearing must be a minimum of 1 inch.

TABLE 4—SECTION PROPERTIES

MEMBER (name)	STUD SECTION ID	MIL THICKNESS (mils)	WEIGHT (lb/ft)	GROSS					EFFECTIVE		MOMENTS			CRITICAL UNBRACED LENGTH
				Area (in <sup>2</sup> )	I <sub>x</sub> (in <sup>4</sup> )	r <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	r <sub>y</sub> (in)	I <sub>xd</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	ALLOWABLE MOMENT <sup>3</sup>  M <sub>a</sub> (in-k)	LOCAL BUCKLING NOMINAL MOMENT  M <sub>nl</sub> (in-k)	DISTORTIONAL BUCKLING NOMINAL MOMENT  M <sub>nd</sub> (in-k)	
Viper25	162VS125-15	15	0.242	0.071	0.0320	0.671	0.0151	0.461	0.0322	0.0258	0.663	1.42	1.20	25.1
	250VS125-15	15	0.289	0.085	0.0844	0.998	0.0173	0.452	0.0903	0.0423	1.170	2.72	2.12	24.8
	362VS125-15 <sup>1</sup>	15	0.348	0.102	0.1990	1.390	0.0193	0.435	0.2050	0.0580	1.600	3.48	2.90	24.5
	400VS125-15 <sup>1</sup>	15	0.367	0.108	0.2500	1.520	0.0198	0.429	0.2550	0.0612	1.690	3.99	3.06	24.4
	600VS125-15 <sup>2</sup>	15	0.473	0.139	0.6590	2.180	0.0219	0.397	0.6280	0.0854	2.360	5.90	4.27	23.7
Viper20	162VS125-18	19	0.285	0.0839	0.0391	0.683	0.0179	0.462	0.0328	0.0285	1.19	1.99	2.02	21.2
	250VS125-18	19	0.351	0.103	0.106	1.01	0.0227	0.469	0.0942	0.0581	2.09	4.07	3.49	21.9
	362VS125-18	19	0.423	0.124	0.249	1.42	0.0256	0.454	0.213	0.0755	3.08	5.28	5.14	21.5
	400VS125-18	19	0.449	0.132	0.315	1.55	0.0266	0.449	0.265	0.0847	3.44	5.93	5.74	21.5
	600VS125-18	19	0.586	0.172	0.846	2.22	0.0319	0.430	0.647	0.151	5.41	10.6	9.04	21.5
Viper20D	162VS125-20	20	0.315	0.093	0.0419	0.673	0.0195	0.459	0.0498	0.0403	1.270	2.74	2.14	23.4
	250VS125-20	20	0.376	0.111	0.1110	1.000	0.0225	0.451	0.1290	0.0651	2.050	4.50	3.71	23.1
	362VS125-20	20	0.454	0.134	0.2610	1.400	0.0251	0.433	0.2980	0.0904	2.850	6.10	5.15	22.8
	400VS125-21	21	0.515	0.152	0.3520	1.520	0.0275	0.426	0.3770	0.1170	3.690	8.02	6.67	22.7
	600VS125-21 <sup>2</sup>	21	0.665	0.196	0.9290	2.180	0.0304	0.394	0.8690	0.1610	5.060	11.20	9.16	22.0

For SI: 1 plf = 14.5939 N/m, 1 inch = 25.4 mm, 1 inch<sup>2</sup> = 645.16 mm<sup>2</sup>, 1 inch<sup>3</sup> = 16,387.064 mm<sup>3</sup>, 1 inch<sup>4</sup> = 416,231 mm<sup>4</sup>, 1 lb = 0.4536 kg, 1 kip-in = 112.99 N-m. See next page for notes.

TABLE 4—SECTION PROPERTIES (Continued)

MEMBER (name)	STUD SECTION ID	MIL THICKNES S (mils)	WEIGHT (lb/ft)	GROSS					EFFECTIVE		MOMENTS			CRITICAL UNBRACED LENGTH
											ALLOWABLE MOMENT <sup>3</sup>	LOCAL BUCKLING NOMINAL MOMENT	DISTORTIONAL BUCKLING NOMINAL MOMENT	
				Area (in <sup>2</sup> )	I <sub>x</sub> (in <sup>4</sup> )	r <sub>x</sub> (in)	I <sub>y</sub> (in <sup>4</sup> )	r <sub>y</sub> (in)	I <sub>xd</sub> (in <sup>4</sup> )	S <sub>x</sub> (in <sup>3</sup> )	M <sub>a</sub> (in-k)	M <sub>nl</sub> (in-k)	M <sub>nd</sub> (in-k)	
Viper 27mil	162VS125-27	27	0.417	0.123	0.0569	0.682	0.0254	0.456	0.0560	0.0586	1.160	1.93	2.10	30.7
	250VS125-27	27	0.506	0.149	0.1510	1.010	0.0299	0.449	0.1480	0.1060	2.030	3.49	3.39	30.2
	362VS125-27	27	0.611	0.180	0.3560	1.410	0.0335	0.432	0.3500	0.1480	2.930	4.89	5.11	29.8
	400VS125-27	27	0.645	0.190	0.4490	1.540	0.0344	0.426	0.4410	0.1650	3.260	5.45	5.69	29.6
	600VS125-27 <sup>1</sup>	27	0.838	0.246	1.1900	2.200	0.0382	0.394	1.1000	0.2900	5.150	9.65	8.59	28.8
Viper 30mil	162VS125-30	30	0.459	0.135	0.0623	0.680	0.0279	0.455	0.0615	0.0670	1.320	2.21	2.38	30.8
	250VS125-30	30	0.547	0.161	0.1660	1.020	0.0323	0.448	0.1630	0.1200	2.310	3.96	3.86	30.1
	362VS125-30	30	0.669	0.197	0.3910	1.410	0.0366	0.431	0.3850	0.1720	3.390	5.67	5.85	29.7
	400VS125-30	30	0.711	0.209	0.4930	1.540	0.0377	0.425	0.4860	0.1910	3.780	6.31	6.52	29.6
	600VS125-30	30	0.924	0.271	1.3100	2.190	0.0418	0.392	1.2300	0.3410	5.950	11.30	9.93	28.7
Viper 33mil	162VS125-33	33	0.500	0.147	0.0686	0.683	0.0302	0.453	0.0681	0.0773	1.530	2.55	2.71	30.8
	250VS125-33	33	0.606	0.178	0.1830	1.010	0.0356	0.447	0.1810	0.1370	2.650	4.53	4.42*	30.1
	362VS125-33	33	0.748	0.220	0.4320	1.400	0.0404	0.429	0.4280	0.2010	3.960	6.62	6.75	29.7
	400VS125-33	33	0.783	0.230	0.5440	1.540	0.0413	0.424	0.5390	0.2240	4.420	7.38	7.53	29.5
	600VS125-33	33	1.023	0.301	1.4400	2.190	0.0459	0.391	1.3900	0.4000	6.930	13.20	11.6	28.6

For SI: 1 plf = 14.5939 N/m, 1 inch = 25.4 mm, 1 inch<sup>2</sup> = 645.16 mm<sup>2</sup>, 1 inch<sup>3</sup> = 16,387.064 mm<sup>3</sup>, 1 inch<sup>4</sup> = 416,231 mm<sup>4</sup>, 1 lb = 0.4536 kg, 1 kip-in = 112.99 N-m.

<sup>1</sup>Web depth-to-thickness ratio exceeds 200.

<sup>2</sup>Web depth-to-thickness ratio exceeds 260.

<sup>3</sup>The allowable moment is the lesser of the allowable local buckling moment and allowable distortional buckling moment. K<sub>φ</sub> is assumed to be zero for distortional buckling moments.

**SYMBOLS**

I<sub>x</sub> = Strong axis moment of inertia

r<sub>x</sub> = Strong axis radius of gyration

I<sub>y</sub> = Weak axis moment of inertia

r<sub>y</sub> = Weak axis radius of gyration

I<sub>xd</sub> = Effective Strong axis moment of inertia

S<sub>x</sub> = Effective Strong axis section modulus

M<sub>a</sub> = Strong axis allowable bending moment (inclusive of safety factor) based on the critical unbraced length less than or equal to that tabulated.

M<sub>nl</sub> = Nominal moment based on local buckling

M<sub>nd</sub> = Nominal moment based on distortional buckling

L<sub>u</sub> = Maximum unbraced length at which the member is considered to be fully braced for design purposes.

K<sub>φ</sub> = Rotational stiffness



TABLE 5—LIMITING HEIGHTS FOR FULLY BRACED<sup>1</sup> NON-COMPOSITE WALLS

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER25	162VS125-15	12	9'-5"	8'-4"	7'-6"	6'-7"	7'-8"	7'-2"	6'-7"	--	6'-7"	6'-7"	6'-0"	--
		16	8'-1"	7'-6"	6'-10"	6'-0"	6'-7"	6'-7"	6'-0"	--	--	--	--	--
		24	6'-7"	6'-7"	6'-0"	--	--	--	--	--	--	--	--	--
	250VS125-15	12	12'-6"	11'-7"	10'-7"	9'-2"	10'-2"	10'-2"	9'-2"	8'-1"	8'-10"	8'-10"	8'-5"	7'-4"
		16	10'-10"	10'-7"	9'-7"	8'-5"	8'-10"	8'-10"	8'-5"	7'-4"	7'-8"	7'-8"	7'-7"	6'-8"
		24	8'-10"	8'-10"	8'-5"	7'-4"	7'-1"	7'-1"	7'-1"	6'-5"	--	--	--	--
	362VS125-15	12	14'-7"	14'-7"	13'-11"	12'-1"	11'-11"	11'-11"	11'-11"	10'-7"	10'-4"	10'-4"	10'-4"	9'-7"
		16	12'-8"	12'-8"	12'-7"	11'-0"	10'-4"	10'-4"	10'-4"	9'-7"	9'-0"	9'-0"	9'-0"	8'-10"
		24	10'-4"	10'-4"	10'-4"	9'-7"	8'-5"	8'-5"	8'-5"	8'-5"	6'-7"	6'-7"	6'-7"	6'-7"
	400VS125-15	12	15'-0"	15'-0"	15'-0"	13'-1"	12'-4"	12'-4"	12'-4"	11'-5"	10'-7"	10'-7"	10'-7"	10'-5"
		16	13'-0"	13'-0"	13'-0"	11'-11"	10'-7"	10'-7"	10'-7"	10'-5"	9'-2"	9'-2"	9'-2"	9'-2"
		24	10'-7"	10'-7"	10'-7"	10'-5"	8'-6"	8'-6"	8'-6"	8'-6"	6'-5"	6'-5"	6'-5"	6'-5"
	600VS125-15	12	17'-8"	17'-8"	17'-8"	17'-7"	14'-1"	14'-1"	14'-1"	14'-1"	10'-7"	10'-7"	10'-7"	10'-7"
		16	15'-5"	15'-5"	15'-5"	15'-5"	10'-7"	10'-7"	10'-7"	10'-7"	7'-11"	7'-11"	7'-11"	7'-11"
		24	10'-7"	10'-7"	10'-7"	10'-7"	7'-0"	7'-0"	7'-0"	7'-0"	--	--	--	--
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER20	162VS125-18	12	9'-6"	---	7'-7"	6'-7"	8'-4"	---	6'-7"	5'-10"	7'-7"	---	6'-0"	5'-2"
		16	8'-7"	---	6'-11"	6'-0"	7'-7"	---	6'-0"	5'-2"	6'-11"	---	5'-5"	4'-10"
		24	7'-7"	---	6'-0"	5'-2"	6'-7"	---	5'-2"	4'-7"	6'-0"	---	4'-10"	4'-2"
	250VS125-18	12	13'-6"	---	10'-8"	9'-5"	11'-10"	---	9'-5"	8'-2"	10'-8"	---	8'-6"	7'-5"
		16	12'-4"	---	9'-8"	8'-6"	10'-8"	---	8'-6"	7'-5"	9'-8"	---	7'-8"	6'-10"
		24	10'-8"	---	8'-6"	7'-5"	9'-5"	---	7'-5"	6'-6"	8'-4"	---	6'-10"	5'-11"
	362VS125-18	12	17'-8"	---	14'-1"	12'-4"	15'-6"	---	12'-4"	10'-8"	14'-1"	---	11'-2"	9'-10"
		16	16'-1"	---	12'-10"	11'-2"	14'-1"	---	11'-2"	9'-10"	12'-5"	---	10'-1"	8'-11"
		24	14'-1"	---	11'-2"	9'-10"	11'-8"	---	9'-10"	8'-6"	10'-1"	---	8'-11"	7'-8"
	400VS125-18	12	19'-1"	---	15'-1"	13'-2"	16'-8"	---	13'-2"	11'-7"	15'-1"	---	12'-0"	10'-6"
		16	17'-4"	---	13'-10"	12'-0"	15'-1"	---	12'-0"	10'-6"	13'-1"	---	10'-11"	9'-6"
		24	15'-1"	---	12'-0"	10'-6"	12'-5"	---	10'-6"	9'-2"	10'-8"	---	9'-6"	8'-4"
	600VS125-18	12	25'-8"	---	20'-5"	17'-10"	21'-11"	---	17'-10"	15'-7"	19'-0"	---	16'-2"	14'-1"
		16	23'-4"	---	18'-6"	16'-2"	19'-0"	---	16'-2"	14'-1"	15'-10"	---	14'-8"	12'-10"
		24	19'-0"	---	16'-2"	14'-1"	14'-0"	---	14'-0"	12'-5"	10'-6"	---	10'-6"	10'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

<sup>1</sup>Bracing is required at internals not exceeding maximum unbraced length (L<sub>u</sub>) listed in Table 4.



TABLE 5—LIMITING HEIGHTS FOR FULLY BRACED<sup>1</sup> NON-COMPOSITE WALLS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf				
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	
VIPER20D	162VS125-20	12	10'-11"	9'-6"	8'-8"	7'-7"	9'-6"	8'-4"	7'-7"	6'-7"	8'-8"	7'-7"	6'-11"	6'-0"	
		16	9'-11"	8'-8"	7'-11"	6'-11"	8'-8"	7'-7"	6'-11"	6'-0"	7'-8"	6'-11"	6'-4"	--	
		24	8'-8"	7'-7"	6'-11"	6'-0"	7'-2"	6'-7"	6'-0"	--	6'-4"	6'-0"	--	--	
	250VS125-20	12	15'-0"	13'-1"	11'-11"	10'-5"	13'-1"	11'-6"	10'-5"	9'-1"	11'-8"	10'-5"	9'-6"	8'-4"	
		16	13'-7"	11'-11"	10'-10"	9'-6"	11'-8"	10'-5"	9'-6"	8'-4"	10'-1"	9'-6"	8'-7"	7'-6"	
		24	11'-8"	10'-5"	9'-6"	8'-4"	9'-6"	9'-1"	8'-4"	7'-2"	8'-4"	8'-4"	7'-6"	6'-7"	
	362VS125-20	12	19'-6"	17'-4"	15'-10"	13'-10"	15'-11"	15'-1"	13'-10"	12'-0"	13'-10"	13'-10"	12'-6"	10'-11"	
		16	16'-11"	15'-10"	14'-4"	12'-6"	13'-10"	13'-10"	12'-6"	10'-11"	11'-11"	11'-11"	11'-5"	9'-11"	
		24	13'-10"	13'-10"	12'-6"	10'-11"	11'-2"	11'-2"	10'-11"	9'-6"	9'-8"	9'-8"	9'-8"	8'-8"	
	400VS125-21	12	21'-6"	18'-8"	17'-0"	14'-11"	18'-1"	16'-5"	14'-11"	13'-0"	15'-8"	14'-11"	13'-6"	11'-10"	
		16	19'-2"	17'-0"	15'-6"	13'-6"	15'-8"	14'-11"	13'-6"	11'-10"	13'-7"	13'-6"	12'-4"	10'-8"	
		24	15'-8"	14'-11"	13'-6"	11'-10"	12'-10"	12'-10"	11'-10"	10'-4"	11'-1"	11'-1"	10'-8"	9'-5"	
	600VS125-21	12	26'-0"	24'-10"	22'-6"	19'-8"	21'-2"	21'-2"	19'-8"	17'-2"	18'-5"	18'-5"	17'-11"	15'-7"	
		16	22'-6"	22'-6"	20'-5"	17'-11"	18'-5"	18'-5"	17'-11"	15'-7"	15'-11"	15'-11"	15'-11"	14'-2"	
		24	18'-5"	18'-5"	17'-11"	15'-7"	15'-0"	15'-0"	15'-0"	13'-7"	12'-1"	12'-1"	12'-1"	12'-1"	
	Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
				L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
	VIPER 27mil	162VS125-27	12	11'-5"	9'-11"	9'-0"	7'-11"	9'-11"	8'-8"	7'-11"	6'-11"	8'-10"	7'-11"	7'-2"	6'-4"
16			10'-4"	9'-0"	8'-2"	7'-2"	8'-10"	7'-11"	7'-2"	6'-4"	7'-7"	7'-2"	6'-6"	--	
24			8'-10"	7'-11"	7'-2"	6'-4"	7'-2"	6'-11"	6'-4"	--	6'-2"	6'-2"	--	--	
250VS125-27		12	15'-8"	13'-8"	12'-6"	10'-11"	13'-5"	12'-0"	10'-11"	9'-6"	11'-7"	10'-11"	9'-11"	8'-7"	
		16	14'-2"	12'-6"	11'-4"	9'-11"	11'-7"	10'-11"	9'-11"	8'-7"	10'-1"	9'-11"	9'-0"	7'-11"	
		24	11'-7"	10'-11"	9'-11"	8'-7"	9'-6"	9'-6"	8'-7"	7'-7"	8'-2"	8'-2"	7'-11"	6'-11"	
362VS125-27		12	19'-10"	18'-4"	16'-7"	14'-6"	16'-1"	16'-0"	14'-6"	12'-8"	14'-0"	14'-0"	13'-2"	11'-6"	
		16	17'-1"	16'-7"	15'-1"	13'-2"	14'-0"	14'-0"	13'-2"	11'-6"	12'-1"	12'-1"	12'-0"	10'-6"	
		24	14'-0"	14'-0"	13'-2"	11'-6"	11'-5"	11'-5"	11'-5"	10'-1"	9'-11"	9'-11"	9'-11"	9'-1"	
400VS125-27		12	20'-11"	19'-8"	17'-11"	15'-8"	17'-0"	17'-0"	15'-8"	13'-8"	14'-8"	14'-8"	14'-2"	12'-5"	
		16	18'-1"	17'-11"	16'-4"	14'-2"	14'-8"	14'-8"	14'-2"	12'-5"	12'-10"	12'-10"	12'-10"	11'-4"	
		24	14'-8"	14'-8"	14'-2"	12'-5"	12'-0"	12'-0"	12'-0"	10'-11"	10'-5"	10'-5"	10'-5"	9'-11"	
600VS125-27		12	26'-2"	26'-2"	24'-5"	21'-4"	21'-5"	21'-5"	21'-4"	18'-7"	18'-6"	18'-6"	18'-6"	16'-11"	
		16	22'-8"	22'-8"	22'-1"	19'-4"	18'-6"	18'-6"	18'-6"	16'-11"	15'-4"	15'-4"	15'-4"	15'-4"	
		24	18'-6"	18'-6"	18'-6"	16'-11"	13'-7"	13'-7"	13'-7"	13'-7"	10'-2"	10'-2"	10'-2"	10'-2"	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

<sup>1</sup>Bracing is required at internals not exceeding maximum unbraced length (L<sub>u</sub>) listed in Table 4.

TABLE 5—LIMITING HEIGHTS FOR FULLY BRACED<sup>1</sup> NON-COMPOSITE WALLS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf				
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	
VIPER 30mil	162VS125-30	12	11'-8"	10'-2"	9'-4"	8'-1"	10'-2"	8'-11"	8'-1"	7'-1"	9'-4"	8'-1"	7'-5"	6'-6"	
		16	10'-8"	9'-4"	8'-6"	7'-5"	9'-4"	8'-1"	7'-5"	6'-6"	8'-1"	7'-5"	6'-8"	--	
		24	9'-4"	8'-1"	7'-5"	6'-6"	7'-8"	7'-1"	6'-6"	--	6'-7"	6'-6"	--	--	
	250VS125-30	12	16'-2"	14'-2"	12'-11"	11'-4"	14'-2"	12'-5"	11'-4"	9'-10"	12'-5"	11'-4"	10'-2"	8'-11"	
		16	14'-8"	12'-11"	11'-8"	10'-2"	12'-5"	11'-4"	10'-2"	8'-11"	10'-8"	10'-2"	9'-4"	8'-1"	
		24	12'-5"	11'-4"	10'-2"	8'-11"	10'-1"	9'-10"	8'-11"	7'-10"	8'-10"	8'-10"	8'-1"	7'-1"	
	362VS125-30	12	21'-4"	18'-11"	17'-2"	15'-0"	17'-5"	16'-6"	15'-0"	13'-1"	15'-0"	15'-0"	13'-7"	11'-11"	
		16	18'-5"	17'-2"	15'-7"	13'-7"	15'-0"	15'-0"	13'-7"	11'-11"	13'-0"	13'-0"	12'-5"	10'-10"	
		24	15'-0"	15'-0"	13'-7"	11'-11"	12'-4"	12'-4"	11'-11"	10'-5"	10'-7"	10'-7"	10'-7"	9'-5"	
	400VS125-30	12	22'-6"	20'-5"	18'-6"	16'-2"	18'-4"	17'-10"	16'-2"	14'-1"	15'-11"	15'-11"	14'-8"	12'-11"	
		16	19'-5"	18'-6"	16'-10"	14'-8"	15'-11"	15'-11"	14'-8"	12'-11"	13'-8"	13'-8"	13'-5"	11'-8"	
		24	15'-11"	15'-11"	14'-8"	12'-11"	13'-0"	13'-0"	12'-11"	11'-2"	11'-2"	11'-2"	11'-2"	10'-2"	
	600VS125-30	12	28'-2"	27'-10"	25'-4"	22'-1"	23'-0"	23'-0"	22'-1"	19'-4"	19'-11"	19'-11"	19'-11"	17'-6"	
		16	24'-5"	24'-5"	23'-0"	20'-1"	19'-11"	19'-11"	19'-11"	17'-6"	17'-2"	17'-2"	17'-2"	15'-11"	
		24	19'-11"	19'-11"	19'-11"	17'-6"	16'-4"	16'-4"	16'-4"	15'-4"	12'-5"	12'-5"	12'-5"	12'-5"	
	Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
				L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
	VIPER 33mil	162VS125-33	12	12'-1"	10'-7"	9'-7"	8'-5"	10'-7"	9'-4"	8'-5"	7'-4"	9'-7"	8'-5"	7'-7"	6'-8"
16			11'-0"	9'-7"	8'-8"	7'-7"	9'-7"	8'-5"	7'-7"	6'-8"	8'-8"	7'-7"	6'-11"	6'-1"	
24			9'-7"	8'-5"	7'-7"	6'-8"	8'-2"	7'-4"	6'-8"	--	7'-1"	6'-8"	6'-1"	--	
250VS125-33		12	16'-10"	14'-8"	13'-4"	11'-7"	14'-8"	12'-10"	11'-7"	10'-2"	13'-4"	11'-7"	10'-7"	9'-2"	
		16	15'-4"	13'-4"	12'-1"	10'-7"	13'-4"	11'-7"	10'-7"	9'-2"	11'-6"	10'-7"	9'-7"	8'-5"	
		24	13'-4"	11'-7"	10'-7"	9'-2"	10'-10"	10'-2"	9'-2"	8'-1"	9'-5"	9'-2"	8'-5"	7'-4"	
362VS125-33		12	22'-5"	19'-7"	17'-10"	15'-6"	18'-10"	17'-1"	15'-6"	13'-7"	16'-4"	15'-6"	14'-1"	12'-4"	
		16	19'-11"	17'-10"	16'-1"	14'-1"	16'-4"	15'-6"	14'-1"	12'-4"	14'-1"	14'-1"	12'-10"	11'-2"	
		24	16'-4"	15'-6"	14'-1"	12'-4"	13'-4"	13'-4"	12'-4"	10'-10"	11'-6"	11'-6"	11'-2"	9'-10"	
400VS125-33		12	24'-2"	21'-1"	19'-2"	16'-10"	19'-10"	18'-6"	16'-10"	14'-7"	17'-2"	16'-10"	15'-2"	13'-4"	
		16	21'-0"	19'-2"	17'-5"	15'-2"	17'-2"	16'-10"	15'-2"	13'-4"	14'-11"	14'-11"	13'-10"	12'-1"	
		24	17'-2"	16'-10"	15'-2"	13'-4"	14'-0"	14'-0"	13'-4"	11'-7"	12'-1"	12'-1"	12'-1"	10'-7"	
600VS125-33		12	30'-5"	28'-11"	26'-4"	23'-0"	24'-10"	24'-10"	23'-0"	20'-1"	21'-6"	21'-6"	20'-11"	18'-2"	
		16	26'-4"	26'-4"	23'-11"	20'-11"	21'-6"	21'-6"	20'-11"	18'-2"	18'-7"	18'-7"	18'-7"	16'-7"	
		24	21'-6"	21'-6"	20'-11"	18'-2"	17'-6"	17'-6"	17'-6"	15'-11"	15'-2"	15'-2"	15'-2"	14'-6"	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

<sup>1</sup>Bracing is required at internals not exceeding maximum unbraced length (L<sub>u</sub>) listed in Table 4.

TABLE 6—LIMITING HEIGHTS FOR NON-COMPOSITE WALLS BRACED 4 FEET ON CENTERS

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER25	162VS125-15	12	8'-8"	8'-4"	7'-6"	6'-7"	7'-1"	7'-1"	6'-7"	--	6'-1"	6'-1"	6'-0"	--
		16	7'-6"	7'-6"	6'-10"	6'-0"	6'-1"	6'-1"	6'-0"	--	--	--	--	--
		24	6'-1"	6'-1"	6'-0"	--	--	--	--	--	--	--	--	--
	250VS125-15	12	11'-10"	11'-7"	10'-7"	9'-2"	9'-7"	9'-7"	9'-2"	8'-1"	8'-5"	8'-5"	8'-5"	7'-4"
		16	10'-2"	10'-2"	9'-7"	8'-5"	8'-5"	8'-5"	8'-5"	7'-4"	7'-2"	7'-2"	7'-2"	6'-8"
		24	8'-5"	8'-5"	8'-5"	7'-4"	6'-8"	6'-8"	6'-8"	6'-5"	--	--	--	--
	362VS125-15	12	13'-2"	13'-2"	13'-2"	12'-1"	10'-10"	10'-10"	10'-10"	10'-7"	9'-4"	9'-4"	9'-4"	9'-4"
		16	11'-5"	11'-5"	11'-5"	11'-0"	9'-4"	9'-4"	9'-4"	9'-4"	7'-10"	7'-10"	7'-10"	7'-10"
		24	9'-4"	9'-4"	9'-4"	9'-4"	6'-11"	6'-11"	6'-11"	6'-11"	--	--	--	--
	400VS125-15	12	13'-10"	13'-10"	13'-10"	13'-1"	11'-4"	11'-4"	11'-4"	11'-4"	9'-10"	9'-10"	9'-10"	9'-10"
		16	12'-0"	12'-0"	12'-0"	11'-11"	9'-10"	9'-10"	9'-10"	9'-10"	7'-5"	7'-5"	7'-5"	7'-5"
		24	9'-10"	9'-10"	9'-10"	9'-10"	6'-6"	6'-6"	6'-6"	6'-6"	--	--	--	--
600VS125-15	12	14'-1"	14'-1"	14'-1"	14'-1"	9'-5"	9'-5"	9'-5"	9'-5"	7'-1"	7'-1"	7'-1"	7'-1"	
	16	10'-7"	10'-7"	10'-7"	10'-7"	7'-1"	7'-1"	7'-1"	7'-1"	--	--	--	--	
	24	7'-1"	7'-1"	7'-1"	7'-1"	--	--	--	--	--	--	--	--	
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER20	162VS125-18	12	9'-6"	---	7'-7"	6'-7"	8'-4"	---	6'-7"	5'-10"	7'-5"	---	6'-0"	5'-2"
		16	8'-7"	---	6'-11"	6'-0"	7'-5"	---	6'-0"	5'-2"	6'-5"	---	5'-5"	4'-10"
		24	7'-5"	---	6'-0"	5'-2"	6'-0"	---	5'-2"	4'-7"	5'-2"	---	4'-10"	4'-2"
	250VS125-18	12	13'-6"	---	10'-8"	9'-5"	11'-10"	---	9'-5"	8'-2"	10'-8"	---	8'-6"	7'-5"
		16	12'-4"	---	9'-8"	8'-6"	10'-8"	---	8'-6"	7'-5"	9'-4"	---	7'-8"	6'-10"
		24	10'-8"	---	8'-6"	7'-5"	8'-10"	---	7'-5"	6'-6"	7'-7"	---	6'-10"	5'-11"
	362VS125-18	12	17'-1"	---	14'-1"	12'-4"	14'-0"	---	12'-4"	10'-8"	12'-1"	---	11'-2"	9'-10"
		16	14'-10"	---	12'-10"	11'-2"	12'-1"	---	11'-2"	9'-10"	10'-6"	---	10'-1"	8'-11"
		24	12'-1"	---	11'-2"	9'-10"	9'-11"	---	9'-10"	8'-6"	8'-7"	---	8'-7"	7'-8"
	400VS125-18	12	18'-1"	---	15'-1"	13'-2"	14'-10"	---	13'-2"	11'-7"	12'-10"	---	12'-0"	10'-6"
		16	15'-8"	---	13'-10"	12'-0"	12'-10"	---	12'-0"	10'-6"	11'-1"	---	10'-11"	9'-6"
		24	12'-10"	---	12'-0"	10'-6"	10'-6"	---	10'-6"	9'-2"	9'-1"	---	9'-1"	8'-4"
600VS125-18	12	23'-10"	---	20'-5"	17'-10"	19'-6"	---	17'-0"	15'-7"	16'-10"	---	16'-2"	14'-1"	
	16	20'-7"	---	18'-6"	16'-2"	16'-10"	---	16'-2"	14'-1"	14'-7"	---	14'-7"	12'-10"	
	24	16'-10"	---	16'-2"	14'-1"	13'-10"	---	13'-10"	12'-5"	10'-6"	---	10'-6"	10'-6"	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

TABLE 6—LIMITING HEIGHTS FOR NON-COMPOSITE WALLS BRACED 4 FEET ON CENTERS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER20D	162VS125-20	12	10'-7"	9'-6"	8'-8"	7'-7"	8'-7"	8'-4"	7'-7"	6'-7"	7'-6"	7'-6"	6'-11"	6'-0"
		16	9'-2"	8'-8"	7'-11"	6'-11"	7'-6"	7'-6"	6'-11"	6'-0"	6'-6"	6'-6"	6'-4"	--
		24	7'-6"	7'-6"	6'-11"	6'-0"	6'-1"	6'-1"	6'-0"	--	--	--	--	--
	250VS125-20	12	14'-4"	13'-1"	11'-11"	10'-5"	11'-8"	11'-6"	10'-5"	9'-1"	10'-1"	10'-1"	9'-6"	8'-4"
		16	12'-5"	11'-11"	10'-10"	9'-6"	10'-1"	10'-1"	9'-6"	8'-4"	8'-10"	8'-10"	8'-7"	7'-6"
		24	10'-1"	10'-1"	9'-6"	8'-4"	8'-4"	8'-4"	8'-4"	7'-2"	7'-2"	7'-2"	7'-2"	6'-7"
	362VS125-20	12	16'-2"	16'-2"	15'-10"	13'-10"	13'-2"	13'-2"	13'-2"	12'-0"	11'-5"	11'-5"	11'-5"	10'-11"
		16	14'-0"	14'-0"	14'-0"	12'-6"	11'-5"	11'-5"	11'-5"	10'-11"	9'-11"	9'-11"	9'-11"	9'-11"
		24	11'-5"	11'-5"	11'-5"	10'-11"	9'-4"	9'-4"	9'-4"	9'-4"	8'-1"	8'-1"	8'-1"	8'-1"
	400VS125-21	12	17'-10"	17'-10"	17'-0"	14'-11"	14'-7"	14'-7"	14'-7"	13'-0"	12'-7"	12'-7"	12'-7"	11'-10"
		16	15'-6"	15'-6"	15'-6"	13'-6"	12'-7"	12'-7"	12'-7"	11'-10"	10'-11"	10'-11"	10'-11"	10'-8"
		24	12'-7"	12'-7"	12'-7"	11'-10"	10'-4"	10'-4"	10'-4"	10'-4"	8'-11"	8'-11"	8'-11"	8'-11"
600VS125-21	12	23'-1"	23'-1"	22'-6"	19'-8"	18'-11"	18'-11"	18'-11"	17'-2"	16'-5"	16'-5"	16'-5"	15'-7"	
	16	20'-0"	20'-0"	20'-0"	17'-11"	16'-5"	16'-5"	16'-5"	15'-7"	12'-10"	12'-10"	12'-10"	12'-10"	
	24	16'-5"	16'-5"	16'-5"	15'-7"	11'-5"	11'-5"	11'-5"	11'-5"	8'-7"	8'-7"	8'-7"	8'-7"	
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER 27mil	162VS125-27	12	11'-5"	9'-11"	9'-0"	7'-11"	9'-7"	8'-8"	7'-11"	6'-11"	8'-4"	7'-11"	7'-2"	6'-4"
		16	10'-2"	9'-0"	8'-2"	7'-2"	8'-4"	7'-11"	7'-2"	6'-4"	7'-2"	7'-2"	6'-6"	--
		24	8'-4"	7'-11"	7'-2"	6'-4"	6'-10"	6'-10"	6'-4"	5'-6"	--	--	--	--
	250VS125-27	12	15'-7"	13'-10"	12'-6"	10'-11"	12'-10"	12'-0"	10'-11"	9'-6"	11'-0"	10'-11"	9'-11"	8'-8"
		16	13'-6"	12'-6"	11'-5"	9'-11"	11'-0"	10'-11"	9'-11"	8'-8"	9'-7"	9'-7"	9'-0"	7'-11"
		24	11'-0"	10'-11"	9'-11"	8'-8"	9'-0"	9'-0"	8'-8"	7'-7"	7'-10"	7'-10"	7'-10"	6'-11"
	362VS125-27	12	18'-7"	18'-4"	16'-8"	14'-7"	15'-2"	15'-2"	14'-7"	12'-8"	13'-2"	13'-2"	13'-2"	11'-6"
		16	16'-1"	16'-1"	15'-1"	13'-2"	13'-2"	13'-2"	13'-2"	11'-6"	11'-5"	11'-5"	11'-5"	10'-6"
		24	13'-2"	13'-2"	13'-2"	11'-6"	10'-8"	10'-8"	10'-8"	10'-1"	9'-4"	9'-4"	9'-4"	9'-2"
	400VS125-27	12	19'-7"	19'-7"	18'-0"	15'-8"	16'-0"	16'-0"	15'-8"	13'-8"	13'-11"	13'-11"	13'-11"	12'-6"
		16	17'-0"	17'-0"	16'-4"	14'-4"	13'-11"	13'-11"	13'-11"	12'-6"	12'-0"	12'-0"	12'-0"	11'-4"
		24	13'-11"	13'-11"	13'-11"	12'-6"	11'-4"	11'-4"	11'-4"	10'-11"	9'-10"	9'-10"	9'-10"	9'-10"
600VS125-27	12	25'-11"	25'-11"	24'-7"	21'-6"	21'-2"	21'-2"	21'-2"	18'-8"	18'-4"	18'-4"	18'-4"	17'-0"	
	16	22'-6"	22'-6"	22'-4"	19'-6"	18'-4"	18'-4"	18'-4"	17'-0"	14'-5"	14'-5"	14'-5"	14'-5"	
	24	18'-4"	18'-4"	18'-4"	17'-0"	12'-10"	12'-10"	12'-10"	12'-10"	9'-7"	9'-7"	9'-7"	9'-7"	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

TABLE 6—LIMITING HEIGHTS FOR NON-COMPOSITE WALLS BRACED 4 FEET ON CENTERS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER 30mil	162VS125-30	12	11'-10"	10'-4"	9'-4"	8'-2"	10'-4"	9'-0"	8'-2"	7'-1"	8'-11"	8'-2"	7'-5"	6'-6"
		16	10'-8"	9'-4"	8'-6"	7'-5"	8'-11"	8'-2"	7'-5"	6'-6"	7'-8"	7'-5"	6'-8"	--
		24	8'-11"	8'-2"	7'-5"	6'-6"	7'-4"	7'-1"	6'-6"	--	6'-4"	6'-4"	--	--
	250VS125-30	12	16'-4"	14'-2"	12'-11"	11'-4"	13'-7"	12'-5"	11'-4"	9'-11"	11'-10"	11'-4"	10'-4"	9'-0"
		16	14'-5"	12'-11"	11'-8"	10'-4"	11'-10"	11'-4"	10'-4"	9'-0"	10'-2"	10'-2"	9'-4"	8'-1"
		24	11'-10"	11'-4"	10'-4"	9'-0"	9'-7"	9'-7"	9'-0"	7'-10"	8'-4"	8'-4"	8'-1"	7'-1"
	362VS125-30	12	20'-0"	19'-0"	17'-2"	15'-0"	16'-4"	16'-4"	15'-0"	13'-1"	14'-2"	14'-2"	13'-8"	11'-11"
		16	17'-4"	17'-2"	15'-7"	13'-8"	14'-2"	14'-2"	13'-8"	11'-11"	12'-4"	12'-4"	12'-4"	10'-10"
		24	14'-2"	14'-2"	13'-8"	11'-11"	11'-7"	11'-7"	11'-7"	10'-5"	10'-0"	10'-0"	10'-0"	9'-6"
	400VS125-30	12	21'-1"	20'-6"	18'-7"	16'-4"	17'-2"	17'-2"	16'-4"	14'-2"	14'-11"	14'-11"	14'-10"	12'-11"
		16	18'-4"	18'-4"	16'-11"	14'-10"	14'-11"	14'-11"	14'-10"	12'-11"	12'-11"	12'-11"	12'-11"	11'-8"
		24	14'-11"	14'-11"	14'-10"	12'-11"	12'-2"	12'-2"	12'-2"	11'-4"	10'-7"	10'-7"	10'-7"	10'-2"
	600VS125-30	12	28'-0"	28'-0"	25'-6"	22'-4"	22'-10"	22'-10"	22'-4"	19'-6"	19'-10"	19'-10"	19'-10"	17'-8"
		16	24'-2"	24'-2"	23'-2"	20'-2"	19'-10"	19'-10"	19'-10"	17'-8"	17'-1"	17'-1"	17'-1"	16'-1"
		24	19'-10"	19'-10"	19'-10"	17'-8"	15'-7"	15'-7"	15'-7"	15'-6"	11'-8"	11'-8"	11'-8"	11'-8"
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER 33mil	162VS125-33	12	12'-2"	10'-7"	9'-8"	8'-5"	10'-7"	9'-4"	8'-5"	7'-5"	9'-6"	8'-5"	7'-8"	6'-8"
		16	11'-1"	9'-8"	8'-10"	7'-8"	9'-6"	8'-5"	7'-8"	6'-8"	8'-2"	7'-8"	7'-0"	6'-1"
		24	9'-6"	8'-5"	7'-8"	6'-8"	7'-8"	7'-5"	6'-8"	--	6'-8"	6'-8"	6'-1"	--
	250VS125-33	12	16'-11"	14'-8"	13'-5"	11'-8"	14'-5"	12'-11"	11'-8"	10'-2"	12'-6"	11'-8"	10'-7"	9'-4"
		16	15'-4"	13'-5"	12'-2"	10'-7"	12'-6"	11'-8"	10'-7"	9'-4"	10'-10"	10'-7"	9'-7"	8'-5"
		24	12'-6"	11'-8"	10'-7"	9'-4"	10'-2"	10'-2"	9'-4"	8'-1"	8'-10"	8'-10"	8'-5"	7'-5"
	362VS125-33	12	21'-4"	19'-7"	17'-10"	15'-7"	17'-5"	17'-1"	15'-7"	13'-7"	15'-1"	15'-1"	14'-1"	12'-5"
		16	18'-5"	17'-10"	16'-2"	14'-1"	15'-1"	15'-1"	14'-1"	12'-5"	13'-0"	13'-0"	12'-11"	11'-2"
		24	15'-1"	15'-1"	14'-1"	12'-5"	12'-4"	12'-4"	12'-4"	10'-10"	10'-8"	10'-8"	10'-8"	9'-10"
	400VS125-33	12	22'-6"	21'-2"	19'-4"	16'-10"	18'-4"	18'-4"	16'-10"	14'-8"	15'-11"	15'-11"	15'-4"	13'-4"
		16	19'-5"	19'-4"	17'-6"	15'-4"	15'-11"	15'-11"	15'-4"	13'-4"	13'-10"	13'-10"	13'-10"	12'-1"
		24	15'-11"	15'-11"	15'-4"	13'-4"	13'-0"	13'-0"	13'-0"	11'-8"	11'-2"	11'-2"	11'-2"	10'-7"
	600VS125-33	12	29'-10"	29'-2"	26'-6"	23'-1"	24'-4"	24'-4"	23'-1"	20'-2"	21'-1"	21'-1"	21'-0"	18'-5"
		16	25'-10"	25'-10"	24'-1"	21'-0"	21'-1"	21'-1"	21'-0"	18'-5"	18'-4"	18'-4"	18'-4"	16'-8"
		24	21'-1"	21'-1"	21'-0"	18'-5"	17'-2"	17'-2"	17'-2"	16'-0"	14'-6"	14'-6"	14'-6"	14'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

TABLE 7—ALLOWABLE CEILING SPANS

L/240		4 psf						6 psf					
Member (name)	Section ID XXXVS125-XX	Unsupported <sup>1</sup> Joist Spacing (in) o.c.			Supported at Midspan <sup>1</sup> Joist Spacing (in) o.c.			Unsupported <sup>1</sup> Joist Spacing (in) o.c.			Supported at Midspan <sup>1</sup> Joist Spacing (in) o.c.		
		12	16	24	12	16	24	12	16	24	12	16	24
VIPER25	162VS125-15	7'-3"	6'-9"	6'-0"	8'-1"	7'-4"	6'-5"	6'-6"	6'-0"	5'-5"	7'-1"	6'-5"	5'-7"
	250VS125-15	8'-2"	7'-7"	6'-10"	11'-3"	10'-4"	9'-0"	7'-4"	6'-10"	6'-2"	10'-0"	9'-0"	7'-8"
	362VS125-15	9'-1"	8'-6"	7'-8"	12'-0"	11'-0"	9'-9"	8'-3"	7'-8"	6'-11"	10'-8"	9'-9"	8'-5"
	400VS125-15	9'-5"	8'-9"	7'-10"	12'-5"	11'-4"	10'-0"	8'-6"	7'-10"	7'-1"	11'-0"	10'-0"	8'-9"
	600VS125-15	10'-8"	9'-11"	8'-11"	14'-4"	13'-2"	11'-8"	9'-7"	8'-11"	8'-1"	12'-9"	11'-8"	8'-10"
VIPER20	162VS125-19	7'-9"	7'-3"	6'-6"	8'-5"	7'-7"	6'-7"	7'-0"	6'-6"	5'-10"	7'-3"	6'-7"	5'-8"
	250VS125-19	8'-9"	8'-1"	7'-4"	12'-0"	10'-10"	9'-5"	7'-11"	7'-4"	6'-7"	10'-5"	9'-5"	8'-2"
	362VS125-19	9'-7"	8'-11"	8'-0"	13'-6"	12'-6"	11'-1"	8'-8"	8'-0"	7'-3"	12'-1"	11'-1"	9'-10"
	400VS125-19	9'-10"	9'-2"	8'-3"	13'-10"	12'-9"	11'-5"	9'-10"	9'-2"	8'-3"	12'-4"	11'-5"	10'-2"
	600VS125-19	11'-2"	10'-4"	9'-4"	15'-10"	14'-8"	13'-1"	10'-1"	9'-4"	8'-5"	14'-2"	13'-1"	11'-8"
VIPER20D	162VS125-20	7'-10"	7'-3"	6'-6"	9'-4"	8'-6"	7'-5"	7'-1"	6'-6"	5'-10"	8'-2"	7'-5"	6'-6"
	250VS125-20	8'-10"	8'-2"	7'-4"	12'-4"	11'-4"	10'-2"	7'-11"	7'-4"	6'-7"	11'-0"	10'-2"	8'-11"
	362VS125-20	9'-10"	9'-1"	8'-2"	13'-6"	12'-4"	10'-11"	8'-10"	8'-2"	7'-5"	11'-11"	10'-11"	9'-8"
	400VS125-21	10'-4"	9'-7"	8'-7"	14'-4"	13'-2"	11'-7"	9'-3"	8'-7"	7'-9"	12'-8"	11'-7"	10'-3"
	600VS125-21	11'-8"	10'-10"	9'-9"	16'-6"	15'-3"	13'-7"	10'-6"	9'-9"	8'-9"	14'-9"	13'-7"	12'-0"
VIPER 27mil	162VS125-27	8'-11"	8'-3"	7'-4"	9'-9"	8'-10"	7'-9"	8'-0"	7'-4"	6'-7"	8'-6"	7'-9"	6'-9"
	250VS125-27	10'-0"	9'-2"	8'-3"	13'-6"	12'-3"	10'-9"	8'-11"	8'-3"	7'-5"	11'-10"	10'-9"	9'-4"
	362VS125-27	11'-0"	10'-2"	9'-2"	15'-6"	14'-4"	12'-9"	9'-10"	9'-2"	8'-3"	13'-10"	12'-9"	11'-4"
	400VS125-27	11'-4"	10'-6"	9'-5"	15'-11"	14'-9"	13'-1"	10'-2"	9'-5"	8'-6"	14'-3"	13'-1"	11'-8"
	600VS125-27	12'-9"	11'-10"	10'-8"	18'-4"	16'-11"	15'-2"	11'-6"	10'-8"	9'-7"	16'-5"	15'-2"	13'-7"
VIPER 30mil	162VS125-30	9'-4"	8'-7"	7'-8"	10'-1"	9'-2"	8'-0"	8'-4"	7'-8"	6'-10"	8'-10"	8'-0"	7'-0"
	250VS125-30	10'-4"	9'-6"	8'-6"	13'-11"	12'-8"	11'-1"	9'-2"	8'-6"	7'-7"	12'-2"	11'-1"	9'-8"
	362VS125-30	11'-4"	10'-6"	9'-5"	16'-0"	14'-10"	13'-3"	10'-2"	9'-5"	8'-6"	14'-4"	13'-3"	11'-9"
	400VS125-30	11'-8"	10'-10"	9'-8"	16'-5"	15'-2"	13'-7"	10'-6"	9'-8"	8'-9"	14'-9"	13'-7"	12'-1"
	600VS125-30	13'-1"	12'-2"	10'-11"	18'-10"	17'-6"	15'-8"	11'-9"	10'-11"	9'-10"	16'-11"	15'-8"	14'-1"
VIPER 33mil	162VS125-33	9'-9"	8'-11"	7'-11"	10'-5"	9'-5"	8'-3"	8'-8"	7'-11"	7'-1"	9'-1"	8'-3"	7'-3"
	250VS125-33	10'-9"	9'-10"	8'-10"	14'-5"	13'-1"	11'-5"	9'-7"	8'-10"	7'-11"	12'-7"	11'-5"	10'-0"
	362VS125-33	11'-9"	10'-11"	9'-9"	16'-7"	15'-4"	13'-9"	10'-7"	9'-9"	8'-9"	14'-10"	13'-9"	12'-2"
	400VS125-33	12'-1"	11'-2"	10'-0"	17'-0"	15'-8"	14'-1"	10'-10"	10'-0"	9'-0"	15'-3"	14'-1"	12'-7"
	600VS125-33	13'-6"	12'-6"	11'-3"	19'-5"	18'-0"	16'-3"	12'-2"	11'-3"	10'-1"	17'-6"	16'-3"	14'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

<sup>1</sup>All values are for simple spans, with compression flange either unbraced or braced at midspan. All framing members are laterally braced at ends.

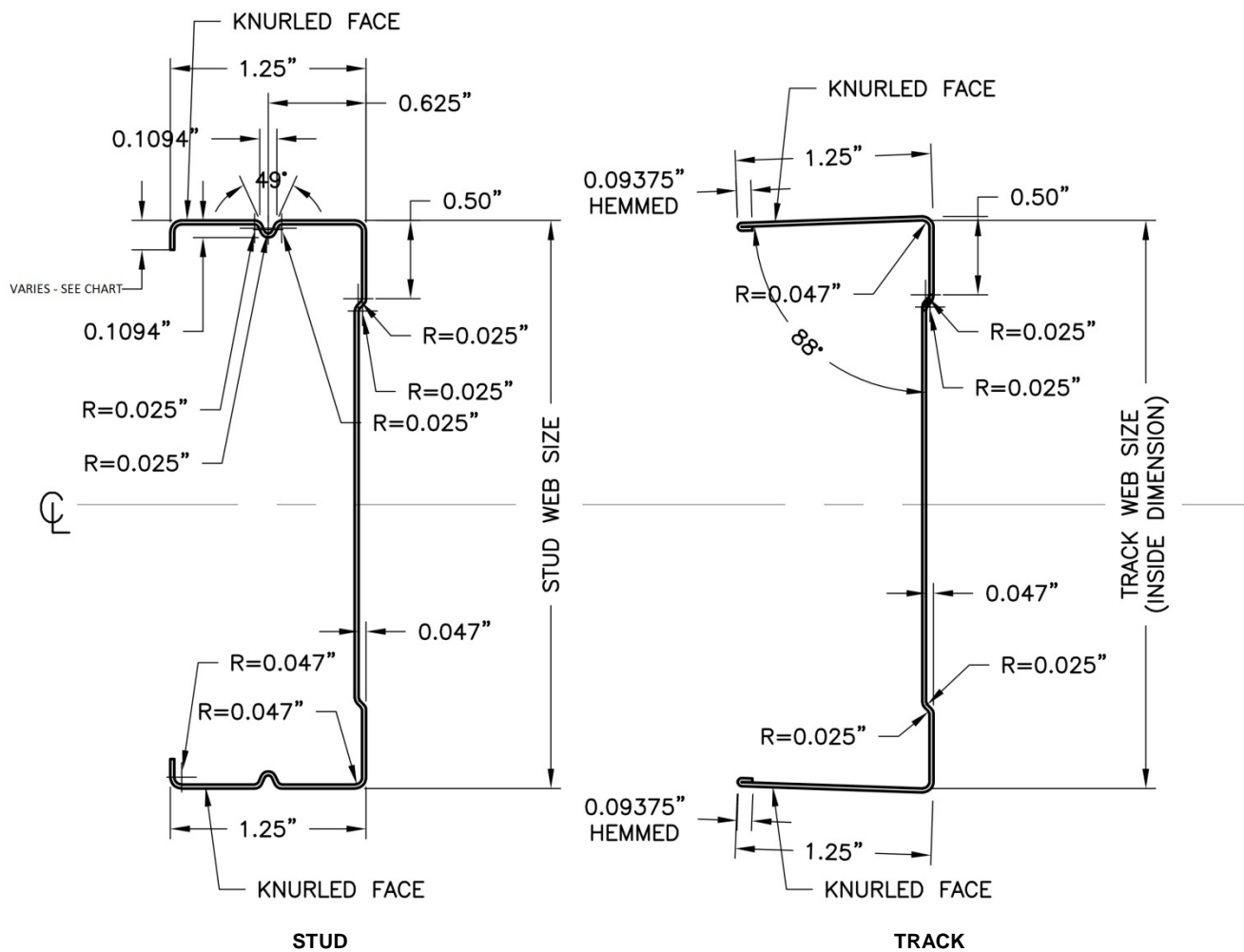
TABLE 7—ALLOWABLE CEILING SPANS (Continued)

L/360		4 psf						6 psf					
Member (name)	Section ID XXXVS125-XX	Unsupported <sup>1</sup> Joist Spacing (in) o.c.			Supported at Midspan <sup>1</sup> Joist Spacing (in) o.c.			Unsupported <sup>1</sup> Joist Spacing (in) o.c.			Supported at Midspan <sup>1</sup> Joist Spacing (in) o.c.		
		12	16	24	12	16	24	12	16	24	12	16	24
VIPER25	162VS125-15	7'-1"	6'-5"	5'-7"	7'-1"	6'-5"	5'-7"	6'-2"	5'-7"	4'-11"	6'-2"	5'-7"	4'-11"
	250VS125-15	8'-2"	7'-7"	6'-10"	10'-0"	9'-0"	7'-11"	7'-4"	6'-10"	6'-2"	8'-8"	7'-11"	6'-11"
	362VS125-15	9'-1"	8'-6"	7'-8"	12'-0"	11'-0"	9'-9"	8'-3"	7'-8"	6'-11"	10'-7"	9'-9"	8'-5"
	400VS125-15	9'-5"	8'-9"	7'-10"	12'-5"	11'-4"	10'-0"	8'-6"	7'-10"	7'-1"	11'-0"	10'-0"	8'-9"
	600VS125-15	10'-8"	9'-11"	8'-11"	14'-4"	13'-2"	11'-8"	9'-7"	8'-11"	8'-1"	12'-9"	11'-8"	8'-10"
VIPER20	162VS125-19	7'-6"	6'-10"	5'-11"	7'-4"	6'-8"	5'-9"	6'-6"	5'-11"	5'-2"	6'-4"	5'-9"	5'-0"
	250VS125-19	8'-9"	8'-1"	7'-4"	10'-5"	9'-6"	8'-3"	7'-11"	7'-4"	6'-7"	9'-1"	8'-3"	7'-2"
	362VS125-19	9'-7"	8'-11"	8'-0"	13'-6"	12'-6"	11'-0"	8'-8"	8'-0"	7'-3"	12'-1"	11'-0"	9'-7"
	400VS125-19	9'-10"	9'-2"	8'-3"	13'-10"	12'-9"	11'-5"	8'-11"	8'-3"	7'-5"	12'-4"	11'-5"	10'-2"
	600VS125-19	11'-2"	10'-4"	9'-4"	15'-10"	14'-8"	13'-1"	10'-1"	9'-4"	8'-5"	14'-2"	13'-1"	11'-8"
VIPER20D	162VS125-20	7'-10"	7'-3"	6'-6"	8'-2"	7'-5"	6'-6"	7'-1"	6'-6"	5'-8"	7'-2"	6'-6"	5'-8"
	250VS125-20	8'-10"	8'-2"	7'-4"	11'-3"	10'-2"	8'-11"	7'-11"	7'-4"	6'-7"	9'-9"	8'-11"	7'-9"
	362VS125-20	9'-10"	9'-1"	8'-2"	13'-6"	12'-4"	10'-11"	8'-10"	8'-2"	7'-5"	11'-11"	10'-11"	9'-8"
	400VS125-21	10'-4"	9'-7"	8'-7"	14'-4"	13'-2"	11'-7"	9'-3"	8'-7"	7'-9"	12'-8"	11'-7"	10'-3"
	600VS125-21	11'-8"	10'-10"	9'-9"	16'-6"	15'-3"	13'-7"	10'-6"	9'-9"	8'-9"	14'-9"	13'-7"	12'-0"
VIPER 27mil	162VS125-27	8'-6"	7'-9"	6'-9"	8'-6"	7'-9"	6'-9"	7'-6"	6'-9"	5'-11"	7'-5"	6'-9"	5'-11"
	250VS125-27	10'-0"	9'-2"	8'-3"	11'-10"	10'-9"	9'-4"	8'-11"	8'-3"	7'-5"	10'-4"	9'-4"	8'-2"
	362VS125-27	11'-0"	10'-2"	9'-2"	15'-6"	14'-4"	12'-6"	9'-10"	9'-2"	8'-3"	13'-9"	12'-6"	10'-11"
	400VS125-27	11'-4"	10'-6"	9'-5"	15'-11"	14'-9"	13'-1"	10'-2"	9'-5"	8'-6"	14'-3"	13'-1"	11'-8"
	600VS125-27	12'-9"	11'-10"	10'-8"	18'-4"	16'-11"	15'-2"	11'-6"	10'-8"	9'-7"	16'-5"	15'-2"	13'-7"
VIPER 30mil	162VS125-30	8'-10"	8'-0"	7'-0"	8'-10"	8'-0"	7'-0"	7'-8"	7'-0"	6'-1"	7'-8"	7'-0"	6'-1"
	250VS125-30	10'-4"	9'-6"	8'-6"	12'-2"	11'-1"	9'-8"	9'-2"	8'-6"	7'-7"	10'-8"	9'-8"	8'-5"
	362VS125-30	11'-4"	10'-6"	9'-5"	16'-0"	14'-9"	12'-11"	10'-2"	9'-5"	8'-6"	14'-2"	12'-11"	11'-3"
	400VS125-30	11'-8"	10'-10"	9'-8"	16'-5"	15'-2"	13'-7"	10'-6"	9'-8"	8'-9"	14'-9"	13'-7"	12'-1"
	600VS125-30	13'-1"	12'-2"	10'-11"	18'-10"	17'-6"	15'-8"	11'-9"	10'-11"	9'-10"	16'-11"	15'-8"	14'-1"
VIPER 33mil	162VS125-33	9'-1"	8'-3"	7'-3"	9'-1"	8'-3"	7'-3"	7'-11"	7'-3"	6'-4"	7'-11"	7'-3"	6'-4"
	250VS125-33	10'-9"	9'-10"	8'-10"	12'-7"	11'-5"	10'-0"	9'-7"	8'-10"	7'-11"	11'-0"	10'-0"	8'-9"
	362VS125-33	11'-9"	10'-11"	9'-9"	16'-7"	15'-3"	13'-4"	10'-7"	9'-9"	8'-9"	14'-8"	13'-4"	11'-8"
	400VS125-33	12'-1"	11'-2"	10'-0"	17'-0"	15'-8"	14'-1"	10'-10"	10'-0"	9'-0"	15'-3"	14'-1"	12'-7"
	600VS125-33	13'-6"	12'-6"	11'-3"	19'-5"	18'-0"	16'-3"	12'-2"	11'-3"	10'-1"	17'-6"	16'-3"	14'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

<sup>1</sup>All values are for simple spans, with compression flange either unbraced or braced at midspan. All framing members are laterally braced at ends.





VIPER20					
Web (in.)	1 <sup>5</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	3 <sup>5</sup> / <sub>8</sub>	4	6
Lip (in.)	0.263	0.330	0.330	0.338	0.400

The lip dimension for all other studs is 0.250 inch.

**STUD WEB SIZES (OUTSIDE DIMENSIONS):**

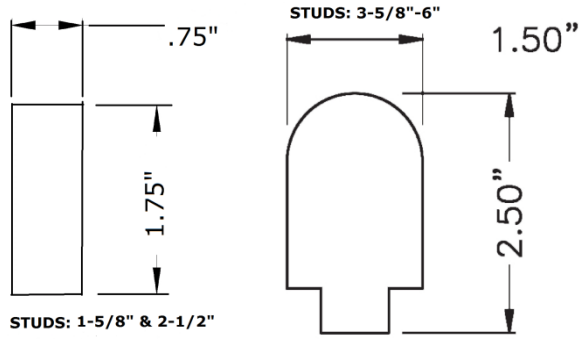
1<sup>5</sup>/<sub>8</sub>" , 2<sup>1</sup>/<sub>2</sub>" , 3<sup>5</sup>/<sub>8</sub>" , 4" & 6"

**TRACK WEB SIZES (INSIDE DIMENSIONS):**

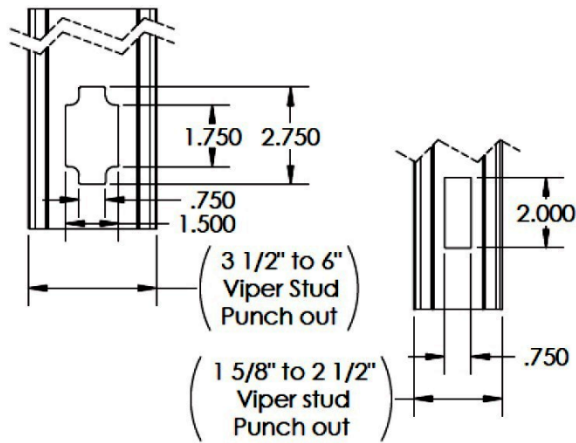
1<sup>5</sup>/<sub>8</sub>" , 2<sup>1</sup>/<sub>2</sub>" , 3<sup>5</sup>/<sub>8</sub>" , 4" & 6"

The hemmed track flange is limited to xxxVT125-15 members.

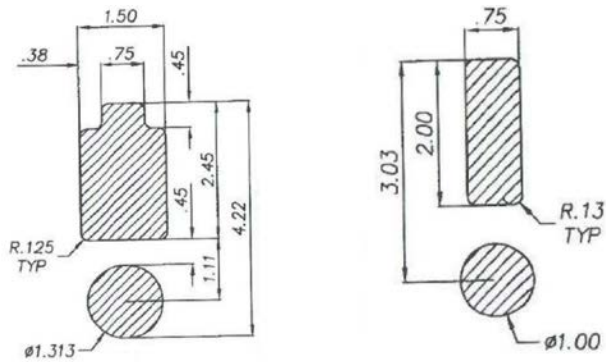
**FIGURE 1—STUD AND TRACK CONFIGURATION**



MarinoWARE



California Expanded Metal Company (CEMCO)



Studs: 3-1/2" to 6"

Studs: 1-5/8" to 2-1/2"

Imperial Building Products

FIGURE 2—PUNCH-OUT CONFIGURATIONS

**DIVISION: 05 00 00—METALS**

**Section: 05 40 00—Cold-Formed Metal Framing**

**DIVISION: 09 00 00—FINISHES**

**Section: 09 22 16.13—Non-Structural Metal Stud Framing**

**REPORT HOLDER:**

**WARE INDUSTRIES, INC. (DBA MarinoWARE)**

**EVALUATION SUBJECT:**

**VIPERSTUD DRYWALL FRAMING SYSTEM (NON-STRUCTURAL): VIPER25, VIPER20, VIPER20D, VIPER 18MIL, VIPER 27MIL, VIPER 30MIL, AND VIPER 33MIL**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in ICC-ES evaluation report ESR-2620, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 *California Building Code (CBC)*

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see section 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code (CRC)*

## 2.0 CONCLUSIONS

### 2.1 CBC:

The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper 20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with CBC Chapter 22, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of the CBC Chapters 16, 17, and 22 as applicable.

**2.1.1 OSHPD:** The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper 20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with amended Sections in Chapters 16, 17 and 22, and Chapters 16A, 17A and 22A provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements in Section 2.1.1.1 of this supplement:

#### 2.1.1.1 Conditions of Use:

1. In accordance with CBC Section 2211.2 and 2211A.2, for cold-formed steel light-frame construction, the design and installation of nonstructural members and connections shall be in accordance with AISI S220 for noncomposite assembly design. Where nonstructural members do not qualify for design under AISI 220, the design and installation of nonstructural members and connectors shall be in accordance with AISI S240 or S100 [OSHPD 1, 1R, 2, 4, and 5].
2. Storage racks and wall-hung cabinet loading per Table 1607.1 [OSHPD 1R, 2, and 5] and Table 1607A.1 [OSHPD 1 and 4] is excluded from this supplement.

**2.1.2 DSA:** The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper 20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with amended Sections in CBC Chapters 16 and 22, and Chapters 16A, 17A and 22A, , provided the design and installation are in accordance

with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements in Section 2.1.2.1 of this supplement:

**2.1.2.1 Conditions of Use:**

1. In accordance with CBC Section 2211A.2, for cold-formed steel light-frame construction, the design and installation of nonstructural members and connections shall be in accordance with AISI S220 for noncomposite assembly design. Where nonstructural members do not qualify for design under AISI 220, the design and installation of nonstructural members and connectors shall be in accordance with AISI S240 or S100 [DSA-SS].
2. Storage racks and wall-hung cabinet loading per Table 1607A.1 [DSA-SS] is excluded from this supplement.
3. Storage racks and wall-hung cabinet loading per Section 1617.5.1.5 [DSA-SS/CC] is excluded from this supplement.

**2.2 CRC:**

The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with the 2019 CRC, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued July 2021.

**DIVISION: 05 00 00—METALS**

Section: 05 40 00—Cold-Formed Metal Framing

**DIVISION: 09 00 00—FINISHES**

Section: 09 22 16.13—Non-Structural Metal Stud Framing

**REPORT HOLDER:**

WARE INDUSTRIES, INC. (DBA MarinoWARE)

**EVALUATION SUBJECT:**

VIPERSTUD DRYWALL FRAMING SYSTEM (NONSTRUCTURAL): VIPER25, VIPER20, VIPER20D, VIPER 18MIL, VIPER 27MIL, VIPER 30MIL, AND VIPER 33MIL

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that the ViperStud Drywall Framing System (Nonstructural), described in ICC-ES evaluation report ESR-2620, has also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2020 Florida Building Code—Building
- 2020 Florida Building Code—Residential

## 2.0 CONCLUSIONS

The ViperStud Drywall Framing System (Nonstructural), described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-2620, complies with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2620 for the 2018 *International Building Code* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the ViperStud Drywall Framing System (Nonstructural) has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued July 2021.